NAME OF THE ORGANISM: Bemisia tabaci (BEMITA)

GENERAL INFORMATION ON THE PEST

Name as submitted in the project specification (if different to the preferred name):
 
  
Pest category:
 
Insecta **1- Identity of the pest/Level of taxonomic listing:**  
Is the organism clearly a single taxonomic entity and can it be adequately distinguished from other entities of the same rank?
 
Yes  
Is the pest defined at the species level or lower?:
 
Yes  
Can listing of the pest at a taxonomic level higher than species be supported by scientific reasons or can species be identified within the taxonomic rank which are the (main) pests of concern?

* Not relevant: Ornamental sector

Is it justified that the pest is listed at a taxonomic rank below species level?
 
Not relevant  
Conclusion:

* Candidate: Ornamental sector

**2 – Status in the EU:**
   
Is this pest already a quarantine pest for the whole EU?
 
No  
Presence in the EU:
 
Yes  
List of countries (EPPO Global Database):
 
Austria (2011); Belgium (2013); Bulgaria (2003); Croatia (2008); Cyprus (2011); Czech Republic (1994); France (2010); France/Corse (1998); Germany (1993); Greece (2013); Greece/Kriti (1994); Hungary (1993); Italy (1994); Italy/Sicilia (2008); Italy/Sardegna (1994); Malta (2012); Netherlands (2015); Poland (1992); Portugal (2008); Portugal/Madeira (2008); Spain (2015); Spain/Islas Canárias (2012); Spain/Islas Baleares (2011); Sweden (1998); United Kingdom (2010); United Kingdom/England (2009)  
Conclusion:
 
candidate  
Justification (if necessary):
 
Only non-European populations of Bemisia tabaci are listed in annex IA1 of Council directive 2000/29/EC. Data of the presence of this pest on the EU territory are available in EPPO Global Database (<https://gd.eppo.int/>). Experts commented that 'non-European populations' is usually only considered in relation to the origin of the plants/consignment on which the pest is found.

HOST PLANT N°1: Euphorbia pulcherrima (EPHPU) for the Ornamental sector.

Origin of the listing:
 
Commission Directive 93/49/EEC  
Plants for planting:
 
Plants intended for planting, other than seeds **3 - Is the pest already listed in a PM4 standard on the concerned host plant?**
 
No 
Conclusion:
 
Evaluation continues **4 - Are the listed plants for planting the main\* pathway for the "pest/host/intended use" combination? (\*: significant compared to others):**
 
Yes 
Conclusion:
 
Candidate  
 
Justification:
 
The host range of B. tabaci covers more than 1 000 species (Mound and Halsey, 1978; De Barro, 1995; Chu et al., 2006; Evans, 2007; Li et al. 2011; EFSA, 2013). Euphorbia pulcherrima and Euphorbia sp are listed as the main ornamental host plants of B. tabaci (Mound and Halsey, 1978; De Barro, 1995; Chu et al., 2006; Dalton, 2006; Evans, 2007; DAF-GWA; 2008; Dalmon et al. 2008; Drayton et al., 2009; Li et al., 2011; EFSA, 2013). In 1987-1993, Fransen (1994) reported an average of 10 annual findings of B. tabaci on Euphorbia pulcherrima in the greenhouses in the Netherlands. The infestation rate (nymphs and pupae density) of host plants of B. tabaci was categorized in four grades in China (Li et al., 2011). Euphorbia pulcherrima was classified with the highest infestation rate – 4th grade (average number of B. tabaci nymphs and pupae > 50/10 cm² leaf area) (Li et al., 2011). Ornamental trade, particularly the poinsettia pathway, was proposed as the main pathway of introduction (and spread) of B. tabaci MEAM1 and Med in the United States (Dalton, 2006), China (Chu et al., 2006), New Zealand (Drayton et al., 2009) and Brazil (Moraes et al., 2017). For the period 1993–2011, 189 interceptions (16% of all interceptions) of B. tabaci are registrated on Euphorbia plants for planting originating from third countries. 325 interceptions on plants for planting from the EU are reported on Euphorbia spp. (61% of all interceptions). Most of interceptions in the EU originating from the Netherlands (46 %) and Germany (17 %) (EUROPHYT; EFSA, 2013). Euphorbia pulcherrima and Hibiscus are the main host plants infested with B. tabaci in the greenhouses in Bulgaria (EPPO Global Database, 2012; EFSA, 2013).  
Except in the Mediterranean coastal region (Cyprus, Greece, Malta, Italy, south of France, certain parts of Spain and Portugal), B. tabaci occurrence is restricted in the EU to greenhouses. Growing B. tabaci host plants under exclusion conditions may be highly effective in the management of this pest and its associated viruses in both field and greenhouse-grown crops, however detailed attention must be given to exclusion netting and entrances etc. For crops in fields or partly-covered facilities, in areas where the pest is established (the Mediterranean coastal region), infestation can take place by flying adults, up to a maximum of 7km in a 12-hour period, though this is not a limiting factor because, with the wide range of putative hosts, suitable host plants are mostly available, and under intensive production suitable host plants, densely spaced, are found within a short distance. Under protected cultivation, plant production is throughout the year and suitable crops follow and rotate at tight intervals, favouring the establishment and dispersal of B. tabaci. Whitefly adults can migrate over long distances via passive transport with wind. However, even considering a climate change scenario with an increase of on average + 2 °C, B. tabaci distribution will expand its most Northern limit but still will not establish outdoors in Northern EU Member States (EFSA, 2013). Experts concluded that the level of importance of the pathway depends very much on conditions e,g, areas of concentrated glasshouse production versus areas where protected cultivation units are isolated from one another (as for Dendranthema) but evidence of plants as pathway is much stronger for this host.  
In conclusion, it is suggested plants for planting would be a significant pathway for crops grown in protected facilities in most of the countries where the pest is not present outside in the environment.  
For Mediterranean coastal region (Cyprus, Greece, Malta, Italy, south of France, certain parts of Spain and Portugal, for field and protected crops, plants for planting would not be a significance source because of the natural dispersal of the pest by flight/wind and the likely ability to eventually enter protected facilities. **5 - Economic impact:**  
Are there documented reports of any economic impact on the host?
 
Yes  
Justification:
 
B. tabaci is considered to be one of the most serious threats to crop cultivation worldwide, predominantly because of the large number of viruses it transmits. It is a sap-sucking insect that can reduce the vigour of plants and excrete a sticky, sugary substance, called honeydew, on the leaves, stems and fruits of its host plants. Adults can also transmit important virus diseases to major vegetable crops, but ornamental species, with only a few exceptions (e.g. Eustoma sp., Lisianthus sp., Manihot sp.), are not considered host plants for viruses transmitted by B. tabaci. Euphorbia pulcherrima is therefore not affected by B. tabaci transmitted viruses but circulatively transmitted viruses (begomoviruses) can also be carried by viruliferous B. tabaci insects along non-hosts plants (EFSA, 2013).  
What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures? (= official measures)
 
  
Is the economic impact due to the presence of the pest on the named host plant for planting, acceptable to the propagation and end user sectors concerned?
 
Yes  
Is there unacceptable economic impact caused to other hosts (or the same host with a different intended use) produced at the same place of production due to the transfer of the pest from the named host plant for planting?
 
Yes  
Conclusion:
 
Candidate  
Justification:
 
Viruliferous B. tabaci insects may not pose an unacceptable risk to the ornamentals but can transfer viruses to vegetable crops sometimes grown in the same premises. Ornamentals may therefore pose an unacceptable risk to plants in the vegetable sector. Appropriate protection measures need to be in place to limit yield losses, and this also includes crops not affected by viruses transmitted by B. tabaci (ornamentals) but on which insect populations can develop rapidly (EFSA, 2013). **6 - Are there feasible and effective measures available to prevent the presence of the pest on the plants for planting at an incidence above a certain threshold (including zero) to avoid an unacceptable economic impact as regards the relevant host plants?**
 
Yes
 
Conclusion:
 
candidate  
Justification:
 
 **7- Is the quality of the data sufficient to recommend the pest to be listed as a RNQP?**
 
Yes
 
Conclusion:
 
Candidate  
Justification:
 
 **CONCLUSION ON THE STATUS:**
 
Recommended for listing as an RNQP, based on data (including evidence of high level of findings on this host, and indirect economic impact). **8 - Tolerance level:**  
Is there a need to change the Tolerance level:
 
Yes  
Proposed Tolerance levels:
 
Zero tolerance based on visual examination. **9 - Risk management measures:**  
Is there a need to change the Risk management measure:
 
Yes  
Proposed Risk management measure:
 
(a) A representative sample of host plants (including weeds) at the site of production have been inspected and found free from Bemisia tabaci during the last growing period before dispatch;  
or  
(b) Measures have been taken at the site of production aimed at the elimination of Bemisia tabaci, and the plants have then been inspected and found free from Bemisia tabaci. **REFERENCES:**

* Chu D, Zhang YJ, Brown JK, Cong B, Xu BY, Wu QJ & Zhu GR (2006) The introduction of the exotic Q biotype of Bemisia tabaci from the Mediterranean region into China on ornamental crops. Florida Entomologist 89, 168-174;
* Department of Agriculture and Food, Goverment of Western Australia (DAF-GWA) (2008) A list of recorded host plants of Bemisia tabaci including silverleaf whitefly. Previously available at <http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/ins/slwfhostlist.pdf>;
* Dalmon A, Halkett F, Granier M, Delatte H & Peterschmitt M (2008) Genetic structure of the invasive pest Bemisia tabaci: evidence of limited but persistent genetic differentiation in glasshouse populations. Heredity 100, 316–325;
* Dalton R (2006) Whitefly infestations: the Christmas invasion. Nature 443, 898-900;
* De Barro PJ (1995) Bemisia tabaci biotype B: a review of its biology, distribution and control. CSIRO Australia Division of Entomology Technical Paper. 1-55;
* Drayton GM, Teulon DAJ, Workman PJ & Scott IAW (2009) The Christmas dispersal of Bemisia tabaci (Gennadius) in New Zealand. New Zeland Plant Protection 62, 310-314;
* EFSA Panel on Plant Health (2013) (PLH) Scientific Opinion on the risks to plant health posed by Bemisia tabaci species complex and viruses it transmits for the EU territory. EFSA Journal 11, 3162. Available online: <http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2013.3162/epdf>;
* European and Mediterranean Plant Protection Organisation (EPPO) (2012) EPPO technical document no. 1061: EPPO study on the risk of imports of plants for planting. Available from www.eppo.int/QUARANTINE/EPPO\_Study\_on\_Plants\_for\_planting.pdf;
* Evans GA (2007) Host plant list of the whiteflies (Aleyrodidae) of the world. USDA/Animal Plant Health Inspection Service (APHIS), 290 pp. Available from <http://www.sel.barc.usda.gov:8080/1WF/WhiteflyHost.pdf>;
* Fransen JJ (1994) Bemisia tabaci in the Netherlands; here to stay? Pesticide Science 42, 129-134;
* Li SJ, Xue X, Ahmed MZ, Ren SX, Du YZ, Wu JH, Cuthbertson AGS & Qiu BL, 2011. Host plants and natural enemies of Bemisia tabaci (Hemiptera, Aleyrodidae) in China. Insect Science 18, 101-120;
* McKenzie CL & Osborne LS (2017) Bemisia tabaci MED (Q biotype) (Hemiptera: Aleyrodidae) in Florida is on the move to residential landscapes and may impact open-field agriculture. Florida Entomologist 100(2):481-484. <https://doi.org/10.1653/024.100.0213>;
* Moraes LA, Marubayashi, Yuli VA, Ghanim M, Bello VH, De Marchi BR, Barbosa LF, Ramos-Sobrinho R, Boykin L, Krause-Sakate R & Pavan MA (2017) New invasion of Bemisia tabaci Mediterraneann species in Brazil associated to ornamental plants. Phytoparasitica, 1-9;
* Mound LA & Halsey SH (1978) Whitefly of the World. A Systematic Catalogue of the Aleyrodidae (Homoptera) with Host Plant and Natural Enemy Data. British Museum (Natural History) and Chichester, Wiley, London, UK, 340 pp;